Bone-fixed locator and optical navigation system

Patent claims

1. Bone-fixed locator (3, 5) as reference of a navigation system (1) for determining the spatial position and location of body parts of a mammal, having a recording device, especially a stereo-camera arrangement (9), for locating the position of locators on the basis of signals provided by target markers on the locators and having a control and evaluation device (11) connected to the recording device,
characterized by
fewer than three target markers (3c, 3d, 5c, 5d) provided on a body (3a, 5a) for giving a signal to the recording device and
an engagement portion (3b, 5b) configured for engagement in a bone of the mammal.

2. Locator according to claim 1,
characterized by
a pivot axis lying in a line connecting two target markers (3c, 3d, 5c, 5d).

3. Locator according to claim 1 or 2,
characterized by
two reflector or transmitter elements (3c, 3d, 5c, 5d) provided on a substantially linear or L-shaped body (3a, 5a), which are configured for giving a signal to an optical recording device, especially a stereo-camera arrangement.

4. Locator according to any one of the preceding claims,
characterized in that
the engagement portion is especially in the form of a self-drilling self-tapping thread (3b, 5b).

5. Locator according to claim 2 or 3 or 4,
characterized in that
the longitudinal axis of the self-cutting thread (3b, 5b) lies in the axis connecting the two target markers (3c, 3d, 5c, 5d).

6. Locator according to any one of claims 3 to 5,
characterized in that
the reflector elements are in the form of retro-reflecting spheres (3c, 3d, 5c, 5d).

7. Locator according to claim 1,
characterized by
exactly one target marker, especially a reflector or transmitter element, for giving a signal to an optical recording device.

8. Navigation system (1) for determining the spatial position and location of body parts of a mammal, having a recording device, especially a stereo-camera arrangement (9), for receiving signals provided by locators (3, 5) and a control and evaluation device (11) connected to the recording device, as well as at least two locators in accordance with any one of the preceding claims,
characterized in that
the control and evaluation device is configured for associated evaluation of the signals of in each case at least two locators rigidly connected to one another by way of the bone to establish a bone-fixed co-ordinate system.

9. Navigation system according to claim 8,
characterized in that
in the control and evaluation device (11) there is implemented an evaluation program for the associated evaluation of signals provided by target markers (3c, 3d, 5c, 5d) on the two or more locators (3, 5) so that the signals of at most two target markers on one and the same locator are entered in the position determination.

10. Navigation system according to claim 8 or 9,
characterized by
at least two locators (3, 5) in accordance with any one of the preceding claims.